UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/859,532	05/18/2001	David A. Ford	109528	3492

25944 7590 08/12/2002

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER
WESSMAN, ANDREW E

ART UNIT	PAPER NUMBER
1742	

DATE MAILED: 08/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

MK-5

Office Action Summary	Application No.	Applicant(s)	
	09/859,532	FORD ET AL.	
	Examiner	Art Unit	
	Andrew E Wessman	1742	

-- The MAILING DATE of this communication appears on the cover sheet with th correspondence address --

Period for Reply

~~A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM~~ THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Claims 1-18 have been submitted for examination.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 14-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 14 recites the limitation "the further metal in claim 1. There is insufficient antecedent basis for this limitation in the claim. Claim 1 has recited "a further metal selected from the Transition Series of elements in Period VI of the Periodic Table of elements". The recitation of "the further metal" in claim 14 is referring to the further metal of the group of claim 1, which refers to Period VI elements, and then claim 14 further recites that the metal is tantalum. However, as tantalum is not a Period VI element, claim 14 is improper as there is no basis for claim 14 to depend on claim 1. Claim 14 would be proper if written in independent form.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 12 and 13 are rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility. Claims 12 and 13 are directed to a nickel-tungsten binary alloy containing 13 to 40 wt% tungsten, and having a

solidification temperature of not less than 1300°C and not more than 1400°C with a solidification temperature range of not greater than 20°C. However, as shown in by a binary phase diagram from the ASM Handbook Volume 3 showing the nickel-tungsten system, a nickel-tungsten alloy would have a minimum solidification temperature of over 1455°C for the claimed compositional range. Therefore, an alloy meeting the description of claims 12 and 13 would not exist.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 3-7, 11 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Mankins (U.S. Patent No. 4,900,394).

Mankins anticipates the invention substantially as claimed. Mankins discloses (col. 3, lines 38-65, including table II) a nickel-base single crystal seed alloy containing up to 26 wt% chromium, which is from Period VI of the periodic table of the elements.

In regards to the features of claim 3, Mankins discloses (see col. 3, Table II) that the seed alloy may consist essentially of nickel and chromium.

In regards to the features of claim 4, Mankins discloses (see col. 3, lines 38-65) the alloy can contain Period VI elements in amounts of up to 26 wt%.

In regards to the features of claim 5, Mankins discloses (see col. 3, lines 60-61) that the alloy may be devoid of oxides.

In regards to the features of claims 6 and 7, Mankins discloses (see col. 3, Table II) that the alloys may contain 0 wt% of Al and/or Ti.

In regards to the features of claim 11, Mankins discloses (col. 3, Table II) that the nickel single crystal seed alloy may contain tungsten as the additional element in amounts of up to 12 wt%.

In regards to the features of claim 14, Mankins discloses (col. 3, Table II) that the nickel single crystal seed alloy may contain tantalum as the additional element in amounts of up to 8 wt%.

8. Claims 2 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Mankins in view of ASM Handbook, Volume 3.

The disclosure of Mankins is discussed in above paragraph 7.

In regards to the features of claim 2, wherein the alloy would have a solidification temperature of between 1300 and 1400°C, this property would be inherent in any nickel-chromium binary alloy. As evidence of this inherency, the examiner directs applicant's attention to the binary phase diagram for a Nickel-Chromium system as found in the ASM Handbook, Volume 3, page 155. This diagram clearly shows that for the applicant's claimed compositional ranges, it is possible to have an alloy with a solidification temperature of between 1300 and 1400°C.

In regards to the features of claims 8 and 9, the alloy of the claimed invention would inherently have a solidification temperature range of not greater than 20°C, which is also evident from the nickel-chromium phase diagram from ASM Handbook 3, page 155. The small area between the liquid phase region and the (Ni) region is the

solidification range in the nickel-chromium binary phase diagram, and it is evident that the solidification temperature range in such an alloy is not greater than 20°C, as this range is represented by a thin band on the diagram.

In regards to the features of claim 10, Mankins discloses a nickel single crystal seed alloy that contains up to 26 wt% of chromium, a Period VI metal. As discussed above, such an alloy would inherently have a solidification temperature of between 1300 and 1400°C and a solidification temperature range of not greater than 20°C, as shown in the phase diagram.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mankins in view of Yamazaki et al. (U.S. Patent No. 4,707,192).

The teachings of Mankins are discussed in above paragraph 7.

Mankins does not teach adding tungsten to the alloy in amounts of over 12 wt%.

Yamazaki et al. teaches (col. 4, lines 1-6) that tungsten may be added to nickel single-crystal alloys in amounts of 7.5 to 20 wt% in order to strengthen the the gamma and gamma prime phases.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add up to 20 wt% tungsten to the nickel single crystal alloy of

Mankins in order to strengthen the gamma and gamma prime phases, as taught by Yamazaki et al.

11. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mankins in view of Yamazaki et al. as applied to claim 12 above, and further in view of ASM Handbook 3.

With regards to the features of the claimed invention, wherein the alloy has a solidification point of between 1300 and 1400°C and a solification temperature range of less than 20°C, as discussed in above paragraph 5, these features would not be achievable in an alloy of the claimed composition, and this is shown in the phase diagram for a nickel-tungsten alloy, as shown in ASM Handbook, Vol. 3.

12. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mankins in view of Shankar et al. (U.S. Patent No. 4,764,225).

The teachings of Mankins are discussed in above paragraph 7.

Mankins does not teach the addition of tantalum in amounts of greater than 8 wt%, such as 13 to 25wt% as claimed.

Shankar et al. teaches (see abstract) the addition of up to 30 wt% of any one of a group of elements including tantalum, and Shankar et al. also teaches (col. 2, lines 57-61) that the addition of such elements is useful for improving resistance to elevated temperature deformation.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add tantalum in amounts of up to 30 wt% as taught by Shankar et al. to the single crystal seed alloy of Mankins because it would have been expected

to improve the resistance to elevated temperature deformation, as taught by Shankar et al. (col. 2, lines 57-61).

13. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mankins in view of Shankar et al. as applied to claims 15-17 above, and further in view of ASM Handbook 3.

The teachings of Mankins in view of Shankar et al. are discussed in above paragraph 12.

With regards to the features of claim 18, as shown in the ASM Handbook, Volume 3, page 319, the nickel-tantalum binary phase diagram shows that one of ordinary skill in the art would have expected the nickel-tantalum alloy of the claimed invention to have a solidification temperature of between 1300 and 1400°C and a solidification temperature range of less than 20°C because this is shown by the phase diagram to be an inherent property of an alloy with the claimed composition.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew E Wessman whose telephone number is (703)305-3163. The examiner can normally be reached on Monday through Friday, 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (703)308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

AEW
August 8, 2002